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☐ 1. Document ID: EP 795424 A1

L8: Entry 1 of 2 File: EPAB Sep 17, 1997

PUB-NO: EP000795424A1
DOCUMENT-IDENTIFIER: EP 795424 A1
TITLE: TITLE DATA NOT AVAILABLE

PUBN-DATE: September 17, 1997

ABSTRACT:

The appts. to apply markings to a mineral fibre material has a plate-shaped stamping block (12) with heaters (14). The stamping block (12) is moved at right angles to the moving mineral fibre material, and moves partially with the movement of the material.

Also claimed is an operation where the mineral fibre material travels under the stamping block and heaters. The block is moved down against the material, travels with it temporarily, and is then lifted clear for the cycle to be repeated.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw Desc | Image

☐ 2. Document ID: EP 795424 A1

L8: Entry 2 of 2 File: DWPI Sep 17, 1997

DERWENT-ACC-NO: 1997-450717
DERWENT-WEEK: 199742

TITLE: Apparatus for marking mineral fibre boards - has stamping block with electrically powered heaters to bear down on material and move with it temporarily

INVENTOR: NABER, W

PATENT-ASSIGNEE:

ASSIGNEE	CODE
PFLEIDERER DAEMMSTOFFTECHNIK GMBH & CO	PFLEN

PRIORITY-DATA: 1996EP-0103878 (March 12, 1996)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
EP 795424 A1	September 17, 1997	G	010	B44B007/00

DESIGNATED-STATES: BE DE FR LU NL

CITED-DOCUMENTS:DE 2503836; EP 244035 ; EP 392884 ; US 4351234

APPLICATION-DATA:

PUB-NO	APPL-DATE	APPL-NO	DESCRIPTOR
EP 795424A1	March 12, 1996	1996EP-0103878	

INT-CL (IPC): B44 B 5/02; B44 B 7/00

ABSTRACTED-PUB-NO: EP 795424A
BASIC-ABSTRACT:

The appts. to apply markings to a mineral fibre material has a plate-shape d stamping block (12) with heaters (14). The stamping block (12) is moved at right angles to the moving mineral fibre material, and moves partially with the movement of the material.

Also claimed is an operation where the mineral fibre material travels under the stamping block and heaters. The block is moved down against the material, travels with it temporarily, and is then lifted clear for the cycle to be repeated.

USE - For processing boards etc. of mineral fibres, to indicate cutting lines etc.

ADVANTAGE - The system applies undistorted and structured markings to the mineral fibre materials.

CHOSEN-DRAWING: Dwg.1/3

TITLE-TERMS: APPARATUS MARK MINERAL FIBRE BOARD STAMP BLOCK ELECTRIC POWER HEATER BEAR DOWN MATERIAL MOVE TEMPORARY

DERWENT-CLASS: L02 P78

CPI-CODES: L02-B08;

SECONDARY-ACC-NO:
CPI Secondary Accession Numbers: C1997-143835
Non-CPI Secondary Accession Numbers: N1997-375501

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Terms	Documents
ep-795424-$.did.	2

Display Format: FULL | Change Format

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PTO 2002-2385

European
Document No. 0,795,424

APPARATUS AND PROCESS FOR APPLYING MARKINGS ON A MINERAL FIBER PRODUCT
[Vorrichtung und Verfahren zum Aufbringen von Markierungen auf ein Mineralfaserprodukt]

Wilfried Naber

UNITED STATES PATENT AND TRADEMARK OFFICE
Washington, D.C. April 2002

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Country	:	European
Document No.	:	0,795,424
Document Type	:	Published patent application
Language	:	German
Inventor	:	Wilfried Naber
Applicant	:	Pfleiderer Dämmstofftechnik Ltd., Wesel, Germany
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Publication Date	:	September 17, 1997
Foreign Language Title	:	Vorrichtung und Verfahren zum Aufbringen von Markierungen auf ein Mineralfaserprodukt
English Title	:	**APPARATUS AND PROCESS FOR APPLYING MARKINGS ON A MINERAL FIBER PRODUCT**

/1[1]

APPARATUS AND PROCESS FOR APPLYING MARKINGS ON A MINERAL FIBER PRODUCT

Apparatus for applying markings on a mineral fiber product comprising: an essentially plate-shape configured stamp block (12), on which heating elements (14) are arranged, which can be brought into contact with the mineral fiber product (44), wherein the stamp block (12) can be guided vertically to and essentially together with the moving mineral fiber product (44) so as to move step-by-step along with the mineral fiber product (44).

The mineral fiber product (44) lies on the transport means and is conducted at a constant transport speed.

The stamp block is hinge-connected with at least two respective flyweights (32), and the flyweights (32) are in turn fixedly connected against rotation with a drive shaft (34) and are placed in rotational motion via a drive.

The drive of the flyweight is connected in such a way to the control apparatus, that the stamp block is conducted while in contact with the mineral fiber product at a constant speed in the transportation direction of the mineral product.

/2

[1] Numbers in the margin indicate pagination in the foreign text.

Description

The invention concerns an apparatus and a process for applying markings on a mineral fiber product.

Mineral fiber products such as mineral fiber strips or mineral fiber plates are provided with markings to allow the user a dimensionally accurate cutting through of the mineral fiber products or to provide the mineral fiber product with brand name or type identifications.

To prevent a dye application with relatively complicated application technique and possibly an influencing of the fire behavior, a marking of this kind is produced in this technology, preferably by weld penetration. Therefore, the mineral fiber product is brought into contact either with a heating element, a directional flame, or a hot air stream, whereby the bonding agent heats in the heating zone up to its decomposition temperature and is discolored thereby. The mineral fiber product is not weakened thereby, because the effect of the heat treatment is only limited to the surface area.

From European patent publication 0,244,035 is known an apparatus for applying marking lines. A roller is mounted on a shaft and has heating rods arranged axis-parallel at the circumference, which are electrically heated via a heating device. The shaft of the roller is mounted on a liftable and lowerable storage rack driven by an electromotor. An electromotor with a free wheel is preferably used, whose free

wheel allows an overdrive of the motor as soon as the roller comes to lie on the mineral fiber product and is driven thereby at increased speed.

While simple geometric markings such as, for example, marking lines, can be produced in a simple manner via a targeted arrangement of the heating elements on the marking roller according to European patent publication 244,035, with complicated geometric shapes such as, for example, company emblems or brand name identifications, is presented the difficulty that these must be arranged on the marking roller in the form of heating elements in such a way that after unrolling of the same is produced the desired image. Also the size of a complicated configured marking such as, for example, a company emblem, is limited by the circumference of a marking roller. Finally, on a curved surface, as is the case in the circumferential surface of a marking roller, a good dimensional accuracy between the heating elements can be obtained only with a great effort.

Based on European patent publication 0,244,035, the object of the invention is to provide a marking apparatus on which the shape to be marked can be arranged without distortion in the form of suitable heating elements.

This technical problem is solved by an apparatus for the application of markings on a mineral fiber product or a mineral fiber plate with the features of claim 1 as well as a process according to the features of claim 11.

By configuring the stamp block on which the heating elements are arranged essentially in the shape of a plate, the markings which are to be imprinted on the mineral fiber strip or mineral fiber plate such as, for example, symbols, can be configured without distortion on the stamp block. The stamp block is not arranged fixed on one location, but is movably guided, so that it can move essentially step-by-step with the moving mineral fiber product. In this way, during the contact time between the stamp block and the mineral fiber product to be imprinted, the stamp block can be moved essentially at the same speed as the moving mineral fiber product and heat can be transmitted, at the same time, onto the surface of the mineral fiber product.

The preferred embodiments of the invention are characterized by the features of the other claims.

The mineral fiber product rests advantageously on a transport means and is guided at a constant transport speed. This facilitates the coordination of the motion of the stamp block with the speed of the mineral fiber product, so that markings can be obtained which are free of distortion and have sharp contours.

The heating elements are preferably electrically heatable, wherein one or several flexible cables for the transmission of current to the heating elements can be attached to the stamp block. Differently as when using a rotating marking element, such as a marking roller, the electric energy to be supplied for the heating of the heating elements must not be transmitted over

slip rings, but can be simply and comfortably transmitted from the voltage source to the stamp block in the form of a suitable transmission connector with a flexible cable connected thereto.

The stamp block is preferably hinge-connected to at least two flyweights and the flyweights are fixedly connected against rotation to a drive shaft and are displaced by a drive in a rotating motion. By way of the articulated installation at the flyweights, which are in turn displaced by a drive shaft into rotating motion, the stamp block is moved up and down relative to the surface of the mineral fiber product to be imprinted as well as also step-by-step in the transport direction of the mineral fiber product. In this way, it can be achieved that, on the one hand, the stamp block with the heating elements arranged thereon is moved together with the mineral fiber product to be imprinted while it is brought into contact with the same and, on the other hand, in the case of a constant transport speed of the mineral fiber product, a marking can be applied at regular /3 preset intervals. Finally, the spatial alignment of the stamp block with the heating elements remains constant during the rotation of the fly wheels, so that the heating elements face toward the mineral fiber product to be imprinted during each motion phase of the stamp block . In this way, it is possible to transmit the energy required for heating the heating elements in the form of electric energy or steam via a flexible line to the stamp block, because the stamp block itself does not carry out a rotating motion.

The flyweights preferably have a counterweight whose center of mass with respect to the drive shaft is arranged opposite to the articulated connection of the stamp block and the fly wheel. In this way, the wear of the drive shaft of the flyweights as well as also of the drive can be considerably reduced, because no imbalance occurs at the drive shaft and the power of the drive required for the rotation of the drive shaft remains constant.

According to a preferred embodiment, the drive of the flyweights is connected to a control apparatus. In this way, the motion of the stamp block is controlled by presetting a transport speed of the mineral fiber product to be imprinted so that, during the heat transmission process when the stamp block makes contact with the mineral fiber product, the stamp block is guided at the same speed as the mineral fiber product to be marked.

The control apparatus preferably rotates the drive shaft connected thereto, so that the stamp block has a constant speed in the transport direction of the mineral fiber product while it is in contact therewith. For this purpose, the rotation speed of the drive shaft can be slightly or specifically delayed while the stamp block is pressed into the mineral fiber product to be marked, and the rotation speed of the drive shaft can be again slightly accelerated during the following upward directed motion of the stamp block. By way of this measure is held constant the corresponding speed component of the stamp block, which is directed parallel to the transport direction of the mineral fiber product to be marked.

The invention will be described in the following purely as an example in view of the attached figures, wherein:

Fig. 1 shows a lateral view of the apparatus for applying markings on a mineral fiber product vertically to the motion direction of the mineral fiber product;

Fig. 2 shows a section view along the line A-A of Fig. 1; and

Fig. 3 shows a schematic illustration of the speed components of the stamp block with the heating elements during contact with a mineral fiber product.

Fig. 1 shows a lateral view of an embodiment of the apparatus for applying markings on a mineral fiber product. The apparatus, which is generally designated with the reference numeral 10, consists essentially of a stamp block 12, which has a plate shape. The stamp block is preferably made of metal, but can also be made of a suitable plastic material. Heating elements 14 are arranged in a suitable manner on the stamp block 12.

The heating elements 14 can be either integrated directly into the stamp block 12 or however preferably be removably connected thereto. In this way is possible a rapid modification of the apparatus for the different geometric forms to be marked, without having to exchange the entire stamp block. This is particularly then advantageous, when a type identification is to be applied on the mineral fiber product to be marked with the aid of the marking apparatus. When exchanging the produced mineral fiber product must merely be exchanged the corresponding heating

elements at the stamp block to be able to identify individually the different mineral fiber products.

The heating elements 13 are in the example inserted in a punch plate 16, which also contains bores for connecting the punch plate 16 to the stamp block 12 by means of screws 18 or other known attachment elements. The heating elements 14 project a few millimeters over the underside of the stamp block 12 with the punch plate 16 attached thereto, to specifically transmit the heat onto the mineral fiber product to be marked.

The heating elements can have any desired construction shape, which is adapted to the type of heating energy used. In the case of an electric heating of the heating elements, the heating elements are provided with a resistance wire, which carries the current, and in this way produces heat. The heat is conducted by means of a good heat-conducting material onto the heat transmission elements, which project over the lower surface of the punch plate 16. In the case of a heating of the heating elements via steam, pipelines carrying steam form the core of the heating elements. Also in this case, the generated heat is transmitted by using suitable good heat-conducting materials to those parts of the heating elements, which come into contact with the mineral fiber product to be marked.

In the case of a steam heating as well as also an electric heating of the heating elements, suitable provisions are made in the stamp block 12 to distribute and derive the energy carriers in the form of current or hot steam from a central receiving

point in the stamp block 12 to the corresponding heating elements 14. /4

In the embodiment shown in Fig. 1, the heating elements 14 are electrically heated. The electric energy is transmitted over a connector 20 to a flexible cable 22 connected thereto onto the stamp block 12 and is distributed from there to the corresponding heating elements 14.

The stamp block 12 is provided with attachment arrangements 24, which in the simplest case consist of an eye, which is fixedly connected to the stamp block 12, and which serves as accommodation for a shaft 26. The attachment arrangement 24 is preferably provided with roller and slide bearings.

At the stamp block 12 are provided at least two, but preferably, however, four or six attachment arrangements 24, which each receive a shaft 26, with which the stamp block 12 is rotatably connected to a respective flyweight 32. The flyweight is in turn connected against rotation to a drive shaft 34, wherein the usual and known measures of the technology for obtaining a shaft-hub connection fixed against rotation can be used. The drive shaft 34 of each flyweight 32 is connected in turn to a gear arrangement 36, wherein the gear arrangements 36 of several flyweights 32 are connected to each other by means of a cardan-shaft drive 38. The drive torque, which acts on a gear arrangement 35, is thereby uniformly transmitted to the other gear arrangement. The geometric shape of the flyweight is only

shown as an example in Fig. 1 and can be configured in different ways.

The flyweight 32 has a counterweight 40, which is configured as one piece with the flyweight or, however, is carried out by attaching suitable weights to the flyweight. The provision of suitable counterweights leads to a uniform rotation of the flyweights without the occurrence of an undesirable imbalance with the shaking of the flyweights as well as of the stamp block connected thereto, which can lead to an increased wear, an irregular marking on the mineral fiber product, or also to an undesirable noise development.

Fig. 2 shows a section through the apparatus shown in Fig. 1 along the line A-A. Fig. 2 shows therefore the apparatus for applying markings seen in or against the motion direction of the mineral fiber product to be marked.

The stamp block 12 is configured so wide, that it extends over the width of the produced mineral fiber product. In this way can be applied markings over the entire area of the surface of the produced mineral fiber product by a specific application of the heating elements 14.

The gear arrangement 36 is provided with an ingoing shaft 42, via which is introduced the torque from a connected motor or a connected control apparatus. For this purpose, the ingoing shaft 42 is connected against rotation to the drive device. As can be seen in Figs. 1 and 2, no rotation of the stamp block 12 with the heating elements arranged thereon takes place around one

of the flyweight axes of the stamp block 12 during a motion of the flyweight 32 and the operation of the apparatus connected thereto. It moves merely up and down in the viewing direction of Fig. 2. Therefore, it is possible to feed via a flexible connection 22, for example an electric cable, the energy required for the operation of the heating elements in a simple and comfortable way to the marking stamp. In the case of rotating heating elements, such as for example a marking roller, the electric energy must be transmitted via slip rings, whereby their susceptibility to failure is increased and the maintenance intervals become shorter.

As becomes clear from Figs. 1 and 2, the apparatus according to the shown embodiment has four flyweights, wherein each two flyweights are synchronized via a cardan-shaft drive 38 and two flyweights are driven by way of the ingoing shafts 42. In the same way, it is also of course possible to drive all the flyweights independently from each other of also to achieve via a suitable torque transmission that a stamp block with several flyweights attached thereon is moved by means of a single drive device. It is also conceivable to drive only the flyweight on one side of the stamp block, for example, the two flyweights shown in Fig. 1, and to move the flyweights arranged on the opposite-lying side passively therewith.

Fig. 3 shows schematically the path course of the marking stamp consisting of the stamp block and heating element

projecting from the underside of the stamp block and the punch plate during the contact with a mineral fiber product.

The mineral fiber product 44 moves within the frame of the production process with a constant speed v_x, which faces in the x-direction according to the convention decided with respect to the axis directions. Because of the eccentric rotatable attachment of the stamp block with the heating elements attached thereto to the flyweights results the path course 46 of a fixed point on the marking stamp, for example, the contact tip of a heating element 14. Via a suitable constant rotation speed of the drive shaft 34 of the flyweights 32 it can be achieved that a speed v_{1x} of the heating elements is generated, which is equal to the speed v_x of the mineral fiber product 44, within the contact area between the marking stamp and the mineral fiber product 44 identified with K in Fig. 3. This speed v_{1x}, however, is not constant within the entire contact area K, since the heating elements 14 move on a circular path and, in this way, /5 also a speed component of the heating elements directed in the y-direction is formed. This means that at a constant rotation speed of the drive shafts 34 within the contact area K is generated a changing speed component in the x-direction of the heating elements.

This can be countered in that the ingoing shaft or shafts 42 are connected to a suitable control apparatus (not shown), which leads via a slight delay or acceleration of the rotation speed within the contact area K to a constant and speed of the marking

stamp in the x-direction, which is also coordinated with respect to the speed of the mineral fiber product. To achieve this, the rotation speed of the drive shafts 34 after entering the contact area K can be specifically delayed until the point designated in Fig. 1 with "1" is reached. At this time point, the rotation speed of the drive shafts is the lowest and the marking stamp moves at the speed v_{1x} in the x-direction according to the speed of the mineral fiber product to be marked. In addition, the rotation speed can be again specifically increased, so that when leaving the contact area K, the speed v_2 is increased to such an extent that the speed component v_{2x} in the x-direction is again equal to the speed v_x of the mineral fiber product to be stamped. By means of this measure it can be ensured that the marking stamp is moved within the entire contact area at a constant speed in the x-direction, coordinated with respect to the speed of the mineral fiber product.

By providing a planar marking surface can also be undertaken structurally complicated markings, without having to apply the same in the form of an unrolling on a rotating marking element. The stamp blocks with the heating elements integrated therein, or the punch plates with the heating elements arranged therein which can be attached to a stamp block, can be easily and comfortably handled and require in particular only a small space for storage. The heating energy required for heating the heating elements can be transmitted to the stamp block by means of one or several flexible lines in that the marking stamp does not carry out a

rotational motion around one of its flyweights axes. A complicated transmission of the energy form the fixed to the rotating components is not needed. The marking stamp can be moved via a specific control of the rotation speed of the flywheels in such a way that the marking stamp is guided during the entire contact time with the mineral fiber strip or mineral fiber plate to be marked at a constant transport speed, which is to be coordinated with respect to the speed of the mineral fiber product.

Patent Claims

1. Apparatus for applying markings on a mineral fiber product comprising:
   - an essentially plate-shape configured stamp block (12), on which
   - are arranged heating elements (14), which can be brought into contact with the mineral fiber product (44), wherein
   - the stamp block (12) can be moved vertically to the moving mineral fiber product (44) and can essentially move step-by-step together with the mineral fiber product (44).
2. Apparatus for applying markings on a mineral fiber product according to claim 1,
   characterized in that the mineral fiber product (44) rests on a transport means and is guided at a constant transport speed.

3. Apparatus for applying markings on a mineral fiber product according to claim 1 or 2,
characterized in that
the heating elements can be electrically heated.

4. Apparatus for applying markings on a mineral fiber product according to claim 3,
characterized in that
at least one flexible cable (22) for the transmission of current is attached to the heating elements (14) at the stamp block (12).

5. Apparatus for applying markings on a mineral fiber product according to at least one of the preceding claims,
characterized in that
the stamp block is hinge-connected to at least two corresponding flyweights (32) and the flyweights are connected against rotation to a corresponding drive shaft (34) and are set into rotation motion via a drive.

6. Apparatus for applying markings on a mineral fiber product according to claim 5,
characterized in that
the flyweights (32) each have a counterweight (40), whose center of mass with respect to the drive shaft is arranged radially opposite to the articulated connection (24, 26) from the stamp block and the flyweight. /6

7. Apparatus for applying markings on a mineral fiber product according to claim 5 or 6,

characterized in that

the drive of the flyweights is connected to a control apparatus.

8. Apparatus for applying markings on a mineral fiber product according to claim 7,

characterized in that

the control apparatus displaces the connected drive shaft in such a way into rotation motion, that the stamp block is guided while in contact with the mineral fiber product at a constant speed in the transport direction of the mineral fiber product.

9. Apparatus for applying markings on a mineral fiber product according to one or several of the preceding claims 1 to 8,

characterized in that

the heating elements (14) are connected to a punch plate (16), which is releasably attached to the stamp block (12).

10. Apparatus for applying markings on a mineral fiber product according to claim 9,

characterized in that

the heating elements (14) project by a few millimeters over the surface of the punch plate (16) facing the mineral fiber product to be marked.

11. Process for applying markings on the mineral fiber product comprising the steps of:

- moving the mineral fiber product to be marked on a transport means;

- moving a stamp block with heated heating elements on the surface of the mineral fiber product to be marked;
- bringing the heating elements of the stamp block into contact with the mineral fiber product to be marked;
- moving the stamp block while in the contact phase so that the stamp block moves essentially together with the mineral fiber product to be marked; and
- removing the stamp block from the marked mineral fiber product.

12. Process for applying markings on a mineral fiber product according to claim 11, further comprising:
- moving the mineral fiber product to be marked with a constant transport speed; and
- moving the stamp block while in the contact phase at an essentially constant speed in the transport direction of the mineral fiber product, which corresponds essentially to the transport speed of the mineral fiber product.

Application Number	Application No.	Applicant(s)	
	09/649,962	KAWASAKI ET AL.	
	Examiner	Art Unit	
	Alexis Wachtel	1764	

Application Number	Application No.	Applicant(s)	
	09/649,962	KAWASAKI ET AL.	
	Examiner	Art Unit	
	Alexis Wachtel	1764	

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1. Document ID: DE 3713108 A , DE 3713108 C

L5: Entry 1 of 1 File: DWPI Dec 10, 1987

DERWENT-ACC-NO: 1987-349594
DERWENT-WEEK: 198750

TITLE: Transverse marking of mineral fibre web - involves roller with heaters mounted parallel to roller axis, with roller rotating at speed corresp. to that of web feed

INVENTOR: KAUFMANN, F; SCHOLSSHER, H W ; STOYKE, R ; ZINN, E

PATENT-ASSIGNEE:

ASSIGNEE	CODE
GRUENZWEIG & HARTMANN AG	GRUZ

PRIORITY-DATA: 1986DE-0010424 (April 16, 1986)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
DE 3713108 A	December 10, 1987		010	
DE 3713108 C	July 13, 1989		000	

APPLICATION-DATA:

PUB-NO	APPL-DATE	APPL-NO	DESCRIPTOR
DE 3713108A	April 16, 1987	1987DE-3713108	

INT-CL (IPC): B44B 5/02; B44C 1/02; B44C 3/08; E04B 1/76; F04B 1/76; F16L 59/02

ABSTRACTED-PUB-NO: DE 3713108A
BASIC-ABSTRACT:

Transverse lines are marked on a continuous web of material made from mineral fibres by a roller (1) which is rotated at a peripheral speed corresponding to the linear speed of the web. The roller (1) is provided with heaters (30) which are pressed into the surface of the mineral fibre web.

The heaters are mounted on the roller periphery, with their longitudinal axes parallel to the roller axis. Each heater is made of a metal with good thermal conductivity and encloses a tubular heating element (32).

ADVANTAGE - Simple and reliable transverse machining at precise and durable spacings.
ABSTRACTED-PUB-NO:

DE 3713108C
EQUIVALENT-ABSTRACTS:

Transverse lines are marked on a continuous web of material made from mineral fibres by a roller (1) which is rotated at a peripheral speed corresponding to the linear speed of the web. The roller (1) is provided with heaters (30) which are pressed into the surface of the mineral fibre web.

The heaters are mounted on the roller periphery, with their longitudinal axes parallel to the roller axis. Each heater is made of a metal with good thermal conductivity and encloses a tubular heating element (32).

ADVANTAGE - Simple and reliable transverse machining at precise and durable spacings.

CHOSEN-DRAWING: Dwg.2/3 Dwg.2/3

TITLE-TERMS: TRANSVERSE MARK MINERAL FIBRE WEB ROLL HEATER MOUNT PARALLEL ROLL AXIS ROLL ROTATING SPEED CORRESPOND WEB FEED

DERWENT-CLASS: P78 Q43 Q56 Q67

SECONDARY-ACC-NO:
Non-CPI Secondary Accession Numbers: N1987-262074

Terms	Documents
de-3713108-$.did.	1

METHOD AND DEVICE FOR APPLYING MARKING LINES TO A MINERAL-FIBER WEB CONTAINING A BINDING AGENT

Friedrich Kaufmann et al.

UNITED STATES PATENT AND TRADEMARK OFFICE
WASHINGTON, D. C. DECEMBER 2002
TRANSLATED BY THE RALPH MCELROY TRANSLATION COMPANY

FEDERAL REPUBLIC OF GERMANY
GERMAN PATENT OFFICE
PATENT NO. 37 13 108 A1
(Offenlegungsschrift)

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Filing No.:	P 37 13 108.7
Filing Date:	April 16, 1987
Date Laid Open to Public Inspection:	December 10, 1987
Domestic Priority:	
Date:	April 16, 1986
Country:	Germany
No.:	86 10 424.1

METHOD AND DEVICE FOR APPLYING MARKING LINES TO A MINERAL-FIBER WEB CONTAINING A BINDING AGENT

[Verfahren und Vorrichtung zum Aufbringen von Markierungslinien auf eine bindemittelhaltige Mineralfaserbahn]

Inventors:	Friedrich Kaufmann et al.
Applicant:	Grünzweig + Hartmann und Glasfaser AG

Claims /1*

1. Method for applying marking lines to a mineral-fiber web containing a binding agent, for which the surface of the mineral-fiber web lying on a continuous transport belt, particularly a

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* The number in the margin indicates the pagination of the foreign text.

production belt, is exposed to the local heating effect of a stationary heating device, characterized in that the heating device is a roller, whose circumferential surface is laid on the surface of the mineral-fiber web, and which is turned at a speed that produces a circumferential speed of the roller at least approximately corresponding to the transport speed of the mineral-fiber web, and local, sharply limited, axis-parallel linear heating zones on the circumferential surface of the roller are heated to a temperature above the decomposition temperature of the binding agent in the mineral-fiber web.

2. Method according to Claim 1, characterized in that the roller is pressed into the surface of the mineral-fiber web to form a depression.

3. Method according to Claim 2, characterized in that the roller is laid on the mineral-fiber web under its own weight.

4. Method according to Claim 2 or 3, characterized in that the roller is driven by the surface of the mineral-fiber web.

5. Method according to one of Claims 1-4, characterized in that a plurality of heating zones aligned with one another and spaced at intervals from one another is used for forming a broken marking line.

6. Device for performing the method according to at least one of Claims 1-5, characterized by a shaft (2) of a roller (1) supported on a support frame (3) that can be raised and lowered, by heating rods (26) arranged axis-parallel on the circumference of the roller (1), and by a heating device (32) for the heating rods (26).

7. Device according to Claim 6, characterized in that the heating rods (26) are arranged in holders (25) made of heat-absorbing material, such as fibrous pressed composite, which

completely surround the heating rods (26) preferably on their sides arranged within the circumferential surface (29) of the roller (1).

8. Device according to Claim 6 or 7, characterized in that the heating rods (26) project out from the circumferential surface (29) of the roller (1) by a few millimeters.

9. Device according to one of Claims 6-8, characterized in that the heating rods (26) can be heated by embedded electrical tubular heating elements (32).

10. Device according to one of Claims 6-9, characterized in that the roller (1) has an inner carrier body (23) in the shape of a cylindrical polygon with the number of surfaces corresponding to the number of heating rods (26) around the circumference.

11. Device according to one of Claims 6-10, characterized in that the roller (1) can be driven by an electric motor (7) with a free-wheeling hub (44).

12. Device according to one of Claims 6-11, characterized in that the support frame (3) of the roller (1) is held in vertical position by means of an adjustment element (18) that can be adjusted in position by gears.

13. Device according to Claim 12, characterized in that the adjustment element (18) has at least one threaded spindle (20), which engages a holder frame (12) that can be raised or lowered for the support frame (3).

14. Device according to Claim 13, characterized in that the holder frame (12) is connected through a pressure medium drive (14) to the support frame (3) and the latter can be moved by means of the pressure medium drive (14) between an operating position and a standby position.

The invention concerns a method for applying marking lines on a mineral-fiber web containing a binding agent according to the preamble of Claim 1.

Such a method is known from DE-OS 32 29 601. The marking lines to be applied in this document run in the longitudinal direction of the mineral-fiber web, thus in its transport or production direction. For avoiding dye application with relatively expensive application technology, material consumption, and possible effects on combustion properties, a burned-in marking is generated in such a way that a tightly focused flame or a tightly focused stream of hot air with a temperature of, e.g., 600°C is directed onto the surface of the mineral-fiber web, which, in the center region of the flame, heats the binding agent at the surface of the mineral-fiber web to its decomposition temperature and thus changes the color of the web. In this way, generating an edge-parallel marking line in the longitudinal direction of the web only requires the arrangement of a corresponding hot-air nozzle or flame lance over the continuous mineral-fiber web.

However, such a procedure is limited to the application of edge-parallel marking lines; for generating marking lines that are perpendicular to the lateral edges, the hot-air nozzles or the like can no longer be stationary, but instead they must travel perpendicular over the mineral-fiber web and thus they must move together with the mineral-fiber web, which, however, would require considerable expense in terms of installation and especially control to achieve definitive and uniform marking intervals. Furthermore, such a flame or hot-air stream not only generates decomposition of the binding agent limited to the direct surface region, but it also inevitably exhibits a significant depth effect. Thus, at the marking line, there results a zone that penetrates to a greater or lesser extent into the mineral-fiber web, and no binding agent is effective in this zone. This is not harmful in the known case, because this zone runs in the longitudinal direction

of the web and thus is not exposed to forces acting perpendicular to the direction of the marking line. Because such mineral-fiber webs are usually rolled into a roll and stored and transported in roll form, forces appear on zones without any binding agent perpendicular to the longitudinal extent of the mineral-fiber web: if the marking side is on the outside in the roll, then the material tends to form gaps at the marking line; if it is on the inside, the material tends to become compressed. Here, the product can become weakened due to partial decomposition of the fiber composite in the region of the marking line for tensile forces or due to increased crimping effects in the region of the marking line for compressive forces. Such a weakening is then particularly undesired if the material is to have homogenous, panel-like consistency after opening of the roll, like for the case of the parallel German Utility Model Application 86 10 424.1. /2

From DE-OS 34 46 406 it is known to use a roller as a heating device. However, this heating device in the form of a roller is not used to apply marking lines, but instead to generate fixing points penetrating deep into the material of the mineral-fiber web such that the mineral fibers are softened locally and thus fused together. For this purpose, the circumferential surface of the roller has a series of openings, through which hot gas is output at a high temperature typically up to 1000°C in the shape of a lance. The circumferential surface of the roller lies on the surface of the mineral-fiber web, and the roller rotates at a speed corresponding to the transport speed of the mineral-fiber web. Hot-gas output through a series of holes is then permitted only in the region of the bottom apex of the roller, so that the hot gas passes into the mineral-fiber web in the shape of a lance from each opening and forms fixing points. The penetration depth can be further controlled by the negative pressure generated at the opposite side of the mineral-fiber web.

Such a device is not used for applying marking lines, and it is also not suitable for generating marking lines, which practically have no effect on the behavior of the mineral-fiber material at the marking points. The large penetration depth desired in the known case can be reduced by throttling the hot-gas supply, but in every case it is significant because a local hot-gas stream must apply enough energy during the contact time to produce a deep color discoloration. In addition, the lateral limit of the effective region of the hot gas is difficult to create, particularly while the roller rotates, and thus it changes direction. For a hot-gas stream with minimized gas throughput for reducing the penetration depth, lateral stream portions come into play, which in the edge region of the marking still generate partial decomposition of the binding agent and thus lead to an unsharp border of the marking.

Starting from the state of the art according to DE-OS 32 29 601, the invention is based on the problem of creating a method and a device which enable the application of marking lines perpendicular to the side edges on a surface of a mineral-fiber web in the simplest and most reliable way possible and enable an application of cleanly defined marking lines in exact and uniform intervals with lesser penetration depth of the decomposition effects.

The solution of this task is done in terms of a method by the characterizing features of Claim 1 and in terms of a device by the characterizing features of Claim 6.

In this way, initially the concept of using a roller according to DE-OS 34 46 406 is referred to, where the roller lies on the mineral-fiber web. However, instead of using hot gas for the local decomposition of the binding agent, the surface of the roller is heated locally. Such a sharply defined, axis-parallel linear heating zone of correspondingly increased temperature produces a heating effect on the mineral-fiber web predominantly through conduction with a correspondingly steep temperature drop in the heat-absorbing mineral-fiber material, so that the

zone of decomposition remains limited to a flat surface region. In addition, the heating effect drops greatly to the sides, and at the same time a cooling effect can be exerted by adjacent, unheated zones at the circumferential surface of the roller, so that a sharply defined contour is produced. Due to the designed circumferential intervals of the heating zones on the circumferential surface of the roller, uniform intervals for the marking lines are always produced. However, according to the engagement relationships between the roller and the surface of the mineral-fiber web, a corresponding interval of marking lines on the mineral-fiber web can be produced, which deviates minimally from the circumferential interval of the heating zones at the surface of the roller; such a deviation between adjacent marking lines is barely measurable, however, over a plurality of marking lines, they can add up to a size that can be significant if, for example, 20 times the nominal distance of the marking lines is to be determined by counting 20 marking lines: here, instead of the theoretical value of 20x100 mm = 2 m, a different value of, e.g., 1.96 m can result. In order to exclude such minimal, but additive deviations, the roller can be rotated at a circumferential speed that deviates minimally from the transport speed of the mineral-fiber web in order to compensate for such small inaccuracies through the set relationships between the roller and the mineral-fiber web.

Because the energy drain away from the heated zones is limited to the degree that is required for a locally cleanly defined decomposition of the binding agent in just a flat surface layer, the energy consumption is minimized.

In an especially preferred configuration of the invention, the roller is pressed into the surface of the mineral-fiber web according to Claim 2 to form a depression. Through the resulting contact pressure, there results an improvement of the conductive heat transfer from the heating zone to the mineral fibers. Furthermore, the depression formation resulting from the

pressure produces a lengthening of the contact time between the heating zone and mineral fibers and thus also an improvement of the heat transfer. For a certain transport speed of the mineral-fiber web, the heat transfer can thus be adapted to the requirements for forming a clean marking without excessive heat application into the mineral-fiber web: of very slow transport speed there is now only a low contact pressure of the roller and thus a reduction of the compression pressure as well as the contact path, so that the desired heat application occurs according to the relatively long contact time available at a low transport speed, while for a high transport speed, the heat /3
transfer is increased in the short time available by increasing the contact pressure and lengthening the contact path correspondingly. Because the marking preferably occurs on the production belt, whose speed is dictated by production requirements, there results one degree of freedom for adapting the marking requirements to the appropriate production speed such that under all occurring production speeds, a sufficient, but not too strong, heat application into the mineral-fiber web is realized. Obviously, the heat application into the mineral-fiber web can also be completely or additionally affected by controlling the temperature of the heating zones. However, under the viewpoint of heat stress on the roller on one hand and of heat stress of the mineral-fiber web at the contact point with the heating zones on the other hand, there is a relatively narrow optimum temperature range to be maintained as much as possible. The different adjustment of the penetration depth of the roller into the surface of the mineral-fiber web enables a corresponding adaptation of the heat application, without which the temperature of the heating zones must leave the optimum operating range.

Particularly for a fixed, predetermined production speed of a defined mineral-fiber web with uniform raw-material density and uniform binding-agent content or also for freely selectable transport speed of the mineral-fiber web, an adaptation of the heat application to

different requirements can be eliminated or can be satisfied in a narrow range just by temperature control. In such a case, it is especially simple in terms of construction for the configuration of the invention if the roller is laid on the mineral-fiber web under its own weight. Means for variable weight support during operation can thus be eliminated if the weight of the roller is adapted to the predetermined transport speed or if the latter is adapted to the weight of the roller. If necessary, the effective weight of the roller can be changed by counterweights to a desired, reduced value.

The means of Claim 4 also enable a considerable simplification of the design of a device required for performing the method in terms of construction, because for the operation a rotary drive can be eliminated and in all cases, in a raised standby position of the roller for its pre-heating, a simpler rotary drive is required to guarantee a uniform heating of the heating zones arranged distributed over the circumference of the roller.

Through the means of Claim 5, broken, so-called dashed marking lines are produced. These typically satisfy their purpose and make it possible to work with individual, shorter heating zones at intervals, which view of their lesser length expansion, prevent problems such as with addition of heat expansion in the longitudinal direction. In addition, the energy consumption is reduced and corresponding negative effects on the material consistency due to tensile or compressive loading of the fibers in the roll are eliminated such that section by section, there is completely unaffected material.

A device that is especially suitable for performing the method according to the invention is described in detail by the characterizing features of Claim 6. Heating rods thus form an especially favorable option in terms of construction for forming the heating zones required according to the method. For forming straight-line dashed markings, straight-line heating rods

can be used; however, other markings such as grids, monograms, or the like can also be generated, if the heating rods are formed according to the desired marking contour.

Through the means of Claim 7, energy losses or heat dissipation or heat conduction from the heating rods is minimized, wherein at the same time, in particular, the lateral border of the heating rods gives a sharp limit to the heating zones and guarantees clean edges of the marking lines through the good heat-absorbing material of the holder.

If the heating rods according to Claim 8 extend a small amount from the circumferential surface of the roller, then the air surrounding the heating rods provides for cooling of the mineral-fiber material bordering the marking strips during the marking and thus favors a clean formation of the edges of the marking lines. Furthermore, this increases the effect of moving the mineral-fiber material along with the roller, particularly for a roller pressed deeper into the mineral-fiber web, because projecting edges of the heating rods favor this effect.

If the heating rods according to Claim 9 can be heated by embedded electrical tubular heating elements, then in terms of construction there is freedom for the configuration of the heating rods. A conventional tubular heating body can be used, which gives low procurement costs and high operability, without limiting the freedom of the outer contour in terms of construction of the heating rods. However, fundamentally any type of suitable heating device, also a noncontact, e.g., inductively operating, heating device can be used, as long as it is guaranteed that the desired heating can be localized in the heating zones.

An especially favorable configuration in terms of construction is given according to Claim 10 through the use of an inner support body for the roller in the form of a cylindrical polygon. In a simpler way, each straight surface of the polygon can be a support for the holder and the installations of a heating rod in terms of construction.

A synchronization of the drive speed of the roller with that of the transport or production belt can be easily by using a direct-current motor to drive the roller. However, if according to Claim 4 a rotating engagement of the roller to the mineral-fiber web is performed, then according to Claim 11 preferably there is an electric motor with a free-wheeling hub configured advantageously as an alternating-current motor, which in the heating phase provides a continuous, slow rotation of the roller at a non-critical rpm for uniform heating of the heating rods, and whose free-wheeling hub takes over from the motor as soon as the roller is laid on the mineral-fiber web and is driven by the latter an increased speed. For each operating interruption, the electric motor then continues to turn the raised roller to guarantee an always uniform heating of the heating rods.

Particularly for selectively strong pressing of the roller into the mineral-fiber web /4
according to Claim 2, the support frame of the roller is held according to Claim 12 in vertical position by means of an adjustment element that can be adjusted by gears for adapting to different transport speeds of the mineral-fiber web. In this way, the contact relationship of the roller to the mineral-fiber web can be fine-adjusted at any time such that an optimum formation of the markings is produced depending on the instantaneous transport speed of the mineral-fiber web.

Advantageously, the adjustment element according to Claim 13 has at least one threaded spindle, which can be driven, e.g., by an electric step motor and guarantees problem-free fine adjustment and maintenance by remote control. The threaded spindles preferably engage a holder frame that can be raised and lowered for the support frame that can also be raised and lowered. According to Claim 14, this holder frame is connected by a pressure medium drive to the support frame and the latter can move between an operating position and a standby position by means of

the compressed-means drive. In this way, a quick, remotely controlled switching of the roller between lowered operating position and raised standby position can be realized, also for emergency stopping, while the fine adjustment of the relative position of the roller to the mineral-fiber web is realized in the operating position by the adjustment element, whose position does not have to be changed during operating pauses or other interruptions.

Further details, features, and advantages of the invention result from the subsequent description of an embodiment with reference to the drawing.

Shown are:

Figure 1, a side view of an end region of a device according to the invention,

Figure 2, an end view, partially cut-away, of a part of the roller of a device according to the invention in its contact on the surface of the mineral-fiber web, and

Figure 3, a schematically simplified, perspective illustration of the roller according to Figure 2.

In Figure 1, a roller is designated with 1, and it is illustrated enlarged with details in Figure 2 and is schematically simplified in perspective in Figure 3. In Figure 1, in this example, only the left end of the roller 1 can be seen, it being understood that there is a corresponding support of the roller on the opposite end. Also in Figure 1, a shaft is designated with 2, which is connected to the roller 1 and is used for its support. The support of the roller 1 is realized by the shaft 2 on a support frame 3 by means of two-sided bearings 4. Outside of the bearing 4, the shaft 2 projects into an electric junction box 5, in which, in a known way, power is supplied to the rotating parts of the roller 1 by means of the schematically illustrated contact ring 6.

The roller 1 can rotate in support 4 by means of the shaft 2. As a rotary drive, an electric motor 7 is provided, which is supported on the support frame 3 and with a drive pinion 8 drives a

drive gear 9 connected to the shaft 2 so that they rotate together by means of a toothed belt or the like. In this way, the roller 1 can be set in rotational motion in the supports 4.

The support frame 3 can be moved up and down on posts 10 of a stationary gantry that is designated overall with 11. In a corresponding way, a holder frame 12 with a traverse 13 can be moved up and down on the posts 10. The support frame 3 is held on the holder frame 12 by means of pressure medium drive 14 in the form of, e.g., pneumatic cylinders 15, which are supported on the traverse 13 and whose piston rod 16 attaches at 17 on the support frame 3. Thus, for a fixed holder frame 12 retraction of the piston rod 16 into the pressure medium cylinder 15 leads to a lifting of the support frame 3 together with roller 1, so that this comes to rest in a lifted standby position, while the illustrated lowered position of the support frame 3 is the operating position, which is shown in more detail in Figure 2.

The holder frame 12 is connected to a traverse 19 of the stationary gantry 11 by means of the adjustment element 18. The adjustment element 18, e.g., in the form of threaded spindles 20, is activated by means of an electric motor 21, e.g., in the form of a step motor and gear 22. The height position of the traverse 13 and the holder frame 12 can be fine-adjusted to a desired position by means of the adjustment element 18. For an extended piston rod 16 of the compressed-means drive 14, there results a corresponding defined height position of the roller 1. By activating the compressed-means drive 14, the roller 1 can be lowered into this predetermined operating position or lifted into a standby position without changing the position of the holder frame 12 and therefore the fine adjustment setting is raised.

In Figure 2, the lower region of roller 1 is illustrated in an end view and partially in section in the operating position. As can be seen, the roller 1 has a carrier body 23 in the form of a polygon, in the example, in the form of a 20-edge polygon, on whose flat outer surfaces 24,

holders 25 for heating rods 26 are held by screws 27. The heating rods 26 have a support body 28 arranged in the interior of the holder 25 and also marking ribs 30 extending out of the circumferential surface designated with 29 of the roller 1. The heating rods 26 consist of a suitable metal with good heat-conduction properties and have in the region of their support body 28 a round receptacle 31, in the example, for receiving typical tubular heating bodies 32, similar to heating coils in immersion heaters. For mounting the tubular heating elements 32, the heating rods 26 are distributed in a plane 33 radial to the axis of the roller 1, wherein the parts 26a and 26b of the heating rod 26 formed in this way are connected by suitable countersunk screws 34 and 35. After the mounting of the tubular heating body 32 in the receptacle 31 of the two open parts 26a and 26b of the heating rod 26, the heating rod 26 is mounted by inserting the screws 34 and 35 and pushed into the holder 25. Then the holder 25 is provided on its outer circumferential outer side with cover plates 36, which engage shoulders 37 of the support body 28 of each heating rod 26 and hold these reliably in the holder 25.

The holders 25 and also the cover plates 36 consist of a suitable material with poor heat-conduction properties, such as a fibrous or fiber-containing pressed composite based on asbestos or asbestos substitute, in order to prevent heat losses of the heating rods 26 and also for protecting the regions of the circumferential surface 29 on both sides of the marking ribs 30 from heating up and taking heat from the mineral-fiber material of the mineral-fiber web designated with 38. In this way, all of the sides of the heating rods 26 inside the circumferential surface 29 of the roller 1 are surrounded by heat-absorbing material. /5

Each heating rod 26 has a receptacle 39 for the reception of a grounding cable. At least one of the heating rods 26 also has a receptacle 40 in the neighborhood of its marking rib 30 for the reception of a thermosensor. The temperature control with reference to the thermosensor and

also the power supply of the tubular heating body 32 is realized by means of the contact ring 6 (cf. Figure 1). However, due to the fine adjustment of the optimum configuration of the markings through different pressure of the roller 1 on the mineral-fiber web 38, temperature control with reference to thermosensors can also be eliminated and instead only the current supply to the tubular heating bodies 32 can be regulated. In stationary operation, a defined temperature is produced, which is suitable for generating the markings, wherein the optimum configuration of markings can be adjusted by the degree of pressing of the roller 1 into the mineral-fiber web 38.

As can be seen from Figure 3, the marking ribs 30 of the heating rods 26 and, if necessary, the heating rods themselves, extend only over a portion of the axial length of the roller 1, so that several marking ribs 30 form a broken line along an outer line of the roller 1 and are arranged at axial intervals. If the length of the heating rods 26 is limited to the axial extent of the marking ribs 30, then there results a plurality of individual, shorter heating rods with easily controlled thermal expansions.

The connection of heating rods 26 to each other can be realized through lines or a correspondingly circumferential damped piece of the tubular heating body 32, which connects the heating rods 26, approximately in arc shape. On the other hand, if the heating rods 26 extend over the entire axial length of the roller 1 and only the holes required for interrupting the marking extend between the sections, designated as marking ribs 30 of the heating rods 26, then there results a very robust and stable construction, for which the tubular heating bodies 32 are embedded over their entire length in the heating rods 26.

The mineral-fiber web 38 is preferably a type like that described in the scope of the German Utility Model Application G 86 10 242.1 forming the basis for the claim of priority. In the example, it is realized by a non-coated mineral-fiber web 38 with a width of 1200 mm, a

nominal thickness of 100 mm, and a length of 6 m. The raw density can be between 10 and 30 kg/m^3, particularly between 14 and 25 kg/m [sic; m^3], and in the actual example, it is 18 kg/m^3. The binding agent can be, in particular, phenolic resin in a percentage of 6-7 wt.% of the dry binding agent in the product, wherein in the example the binding agent content of phenolic resin was 6.6 wt.% (dry). With reference to the properties and the use of such a mineral-fiber web 38, as well as with reference to other details, the entire contents of Utility Model Application G 86 10 242.1 forming the basis for the claim of priority are incorporated by reference.

During operation, the roller 1 with a pulled-in piston rod 16 above the surface designated with 41 of the mineral fiber web 38 is put into rotation by the electric motor 7, with the heating rods 26 being preheated by current supply to the tubular heating bodies 32 to a desired temperature that is monitored by the thermosensor, if necessary. The rotation in the pre-heating phase guarantees uniform heat losses of the individual heating rods 26 and marking ribs 30 and thus their uniform heating without individual temperature control at each individual heating rod 26. At the beginning of production, the piston rods 16 are extended and the roller 1 is lowered to the surface 41 of the mineral-fiber web 38, wherein by means of the electric motor 21 and the adjustment element 18, a fine adjustment of the height position of the roller 1 can be performed over the mineral-fiber web 38. The adjustment is preferably selected so that the marking ribs 30 on the circumference of the roller 1 press into the surface 41 of the mineral-fiber web 38 with the formation of a depression 42. The deeper the depression 42 for a given mineral-fiber web 38, the higher the contact pressure and the effective period for improving the conductive heat transfer from the marking rib 30 to the mineral-fiber material. The surface 41 of the mineral-fiber web 38 is typically uncovered, that is, it is formed by the irregular orientation of the mineral fiber itself;

however, the surface 41 can also be coated, e. g., in the form of fleece based on mineral fiber or other fibers.

In this way, the marking rib 30 typically has a temperature on the order of magnitude of 400°C and generates a discolored zone indicated by dashed lines 43 of binding-agent decomposition in the mineral-fiber web 38. In this way, marking strips are produced corresponding to the pattern of marking ribs 30 that can be seen in Figure 3 on the surface 41 of the mineral-fiber web 38, which extend perpendicular to the side edges of the mineral-fiber web 41. Through fine adjustment by the adjustment element 18, the heat transfer conditions can be controlled so that a visually clearly set-off marking with sharp edges is produced, without also producing any negative effects on the material of the mineral-fiber web 38 over a flat decomposition zone 43.

By means of the drive pinion 8 and the drive gear 9, a continuous driving of the roller 1 can be performed in sync with the transport speed of the mineral-fiber web 38. Preferably, a direct-current motor is then used as electric motor 7. In the illustrated embodiment, however, an alternating-current motor is used as electric motor 7, which is connected to the drive pinion 8 by means of a free-wheeling hub 44, such that during the driving of the roller 1 by the mineral-fiber web 38 the rotational speed of the roller 1 can overtake that of the electric motor 7. In this case, the drive by the electric motor 7 is used exclusively for maintaining a minimum rotational speed at a non-critical rpm in the lifted standby position when the drive is removed from the mineral-fiber web 38, in order to guarantee a uniform heating of the heating rods 26.

By activating the adjustment element 18, the heat transfer conditions between the marking ribs 30 and the surface 41 of the mineral-fiber web 38 can be adjusted in the mentioned way for forming optimum marking lines. However, for predetermined transport speed and

consistency of the mineral-fiber web 38, such a fine adjustment can also be eliminated, because then there can be a fixed pre-setting of the pressure relationship of the roller 1 on the surface 41 of the mineral-fiber web 38. In this way, the construction for supporting the roller 1 can be considerably simplified. In addition, if the weight of the roller 1 can be maintained so that it alone gives a desired penetration depth through the weight loading of the surface 41 of the mineral-fiber web 38 by the weight of the roller 1, then the compressed-means drive 14 can be switched without pressure in the operating position, so that the roller 1 lies on the mineral-fiber web 38 simply under its own weight. Too strong a penetration can be avoided in this case such that the marking ribs 30 do not project from the undisturbed circumferential surface 29 of the roller 1 by a few millimeters, in the example, approximately 8 mm, but instead lie within the undisturbed circumferential surface 29, so that this helps to contribute to the weight, e.g., in the form of cover plates 36, and thus prevents too strong a local penetration. The illustrated configuration with marking ribs 30 projecting from the circumferential surface 29, however, is suitable, in a particularly excellent way, for driving the roller 1 by the mineral-fiber web 38.

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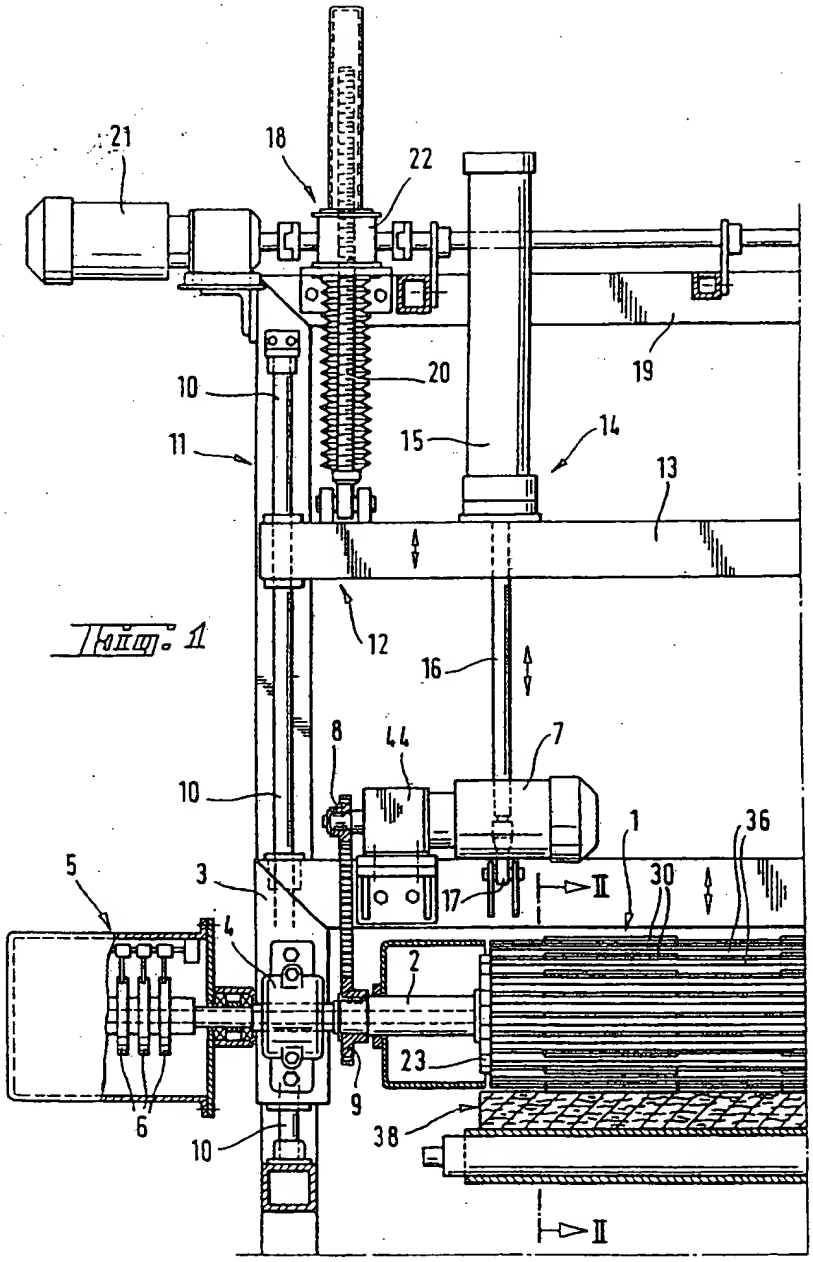
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Фиг. 1

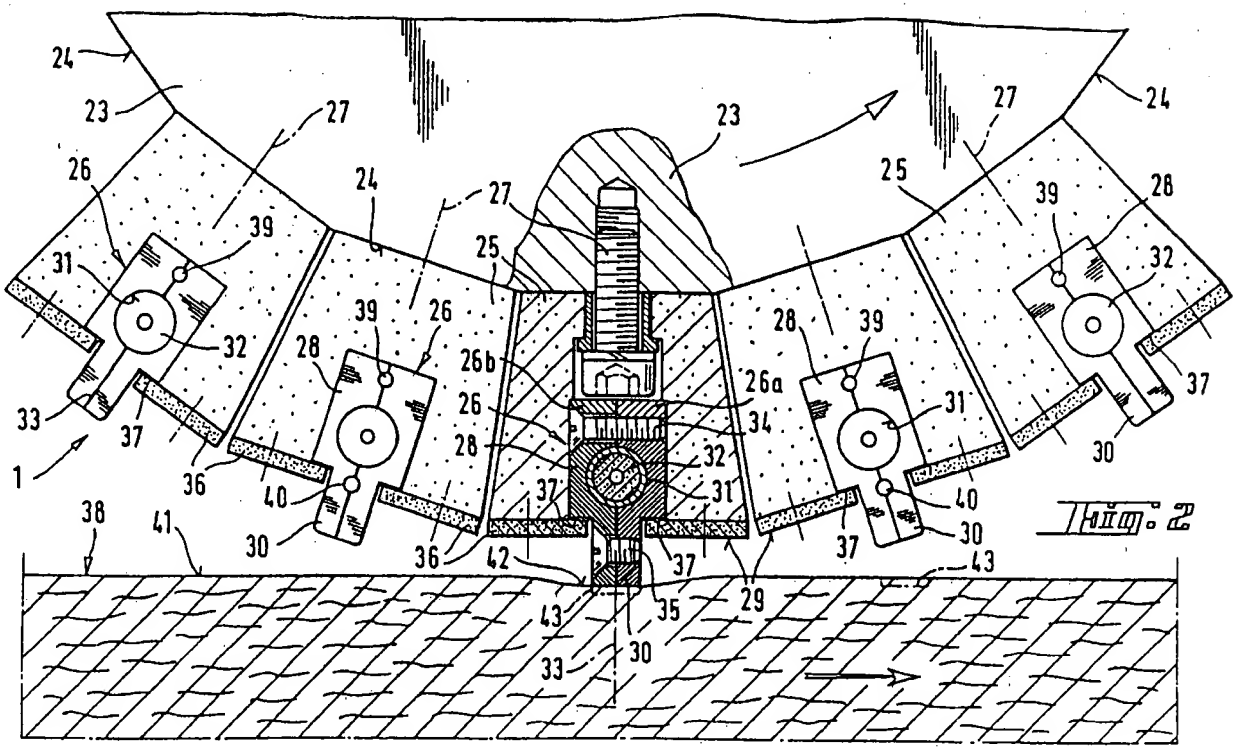

Fig. 2

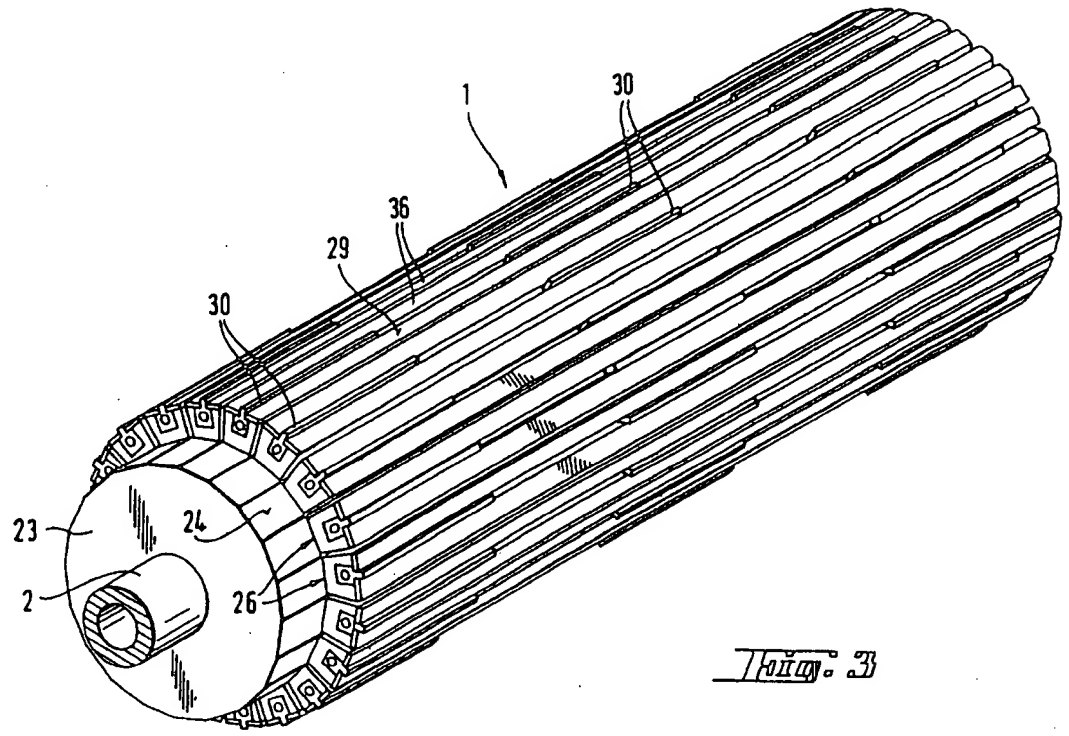

Fig. 3

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☐ 1. Document ID: DE 29822362 U1

L2: Entry 1 of 1 File: DWPI Apr 8, 1999

DERWENT-ACC-NO: 1999-231030
DERWENT-WEEK: 199920

TITLE: Insulation web comprising mineral fiber felt

PATENT-ASSIGNEE:

ASSIGNEE	CODE
PFLEIDERER DAEMMSTOFFTECHNIK GMBH & CO	PFLEN

PRIORITY-DATA: 1998DE-2022362 (December 15, 1998)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
DE 29822362 U1	April 8, 1999		016	E04B001/74

APPLICATION-DATA:

PUB-NO	APPL-DATE	APPL-NO	DESCRIPTOR
DE29822362U1	December 15, 1998	1998DE-2022362	

INT-CL (IPC): E04 B 1/74

ABSTRACTED-PUB-NO: DE29822362U
BASIC-ABSTRACT:

NOVELTY - Markings extending in the length direction and at an angle to this direction are provided on one side of the web to assist cutting.

DETAILED DESCRIPTION - The web can be wound-up into a roll and is provided with markings (12, 14, 16, 20) on the side present on the inside of the wound-up roll. The markings are colored to make them stand out from the web material and they do not weaken the web. The purpose of the markings is to assist cutting of the web and they comprise a number of continuous lines (12, 14, 16) extending in the web length direction, and angle markings (20) extending at selected angles to the web length direction.

USE - The mineral or stone wool web is suitable for thermal and/or noise insulation in walls, roofs or floors.

ADVANTAGE - The combination of straight and angled markings allows highly precise cuts to be made from the web.

DESCRIPTION OF DRAWING(S) - The drawing shows a plan view of a section of the web with the side intended to be on the inside of the wound-up web face-up.

Web section 10

Length direction markings 12, 12a, 14, 14a, 16, 16a, 16b, 16i

Web length edges 18

Protractor marking 20

Circle segment 22

Angle markings 24, 24a, 24b

Circle segment origin 26

Insulation material type marking 28

Insulation material manufacturer marking 30

CHOSEN-DRAWING: Dwg.1/2

TITLE-TERMS: INSULATE WEB COMPRISE MINERAL FELT

DERWENT-CLASS: Q43

SECONDARY-ACC-NO:
Non-CPI Secondary Accession Numbers: N1999-171091

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de-29822362-$.did.	1

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WEST

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Search Results - Record(s) 1 through 2 of 2 returned.

☐ 1. Document ID: EP 795659 A1

L9: Entry 1 of 2 File: EPAB Sep 17, 1997

PUB-NO: EP000795659A1
DOCUMENT-IDENTIFIER: EP 795659 A1
TITLE: Roof construction

PUBN-DATE: September 17, 1997

INVENTOR-INFORMATION:

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JAROSCH, KARL-HEINZ	DE

ASSIGNEE-INFORMATION:

NAME	COUNTRY
PFLEIDERER DAEMMSTOFFTECHNIK G	DE

APPL-NO: EP97103028
APPL-DATE: February 25, 1997

PRIORITY-DATA: DE19610267A (March 15, 1996)

INT-CL (IPC): E04 D 13/16
EUR-CL (EPC): E04D012/00; E04D013/16

ABSTRACT:

The construction has a truss with several rafters (2) which have sheathing (4) on them. This sheathing supports a moisture shielding sheet (6). On the sheathing and sheet, directly over and parallel to the rafters are elongated support lamellae (8) of highly compressed mineral wool which run in the fall line of the roof and connected to the rafters. These lamellae accommodate a roof load on the roof parts (10,12) located over them.

Insulating material is lain on the damp barrier between the lamellae, It has a concealment on the side facing the roof covering support (10,12) which is open to diffusion, weather resistant and/or waterproof. The concealment is directly and/or indirectly connected with the lamellae.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw Desc | Image

☐ 2. Document ID: EP 795659 A1 , SK 9700341 A3, CZ 9700627 A3, DE 19610267 A1

L9: Entry 2 of 2 File: DWPI Sep 17, 1997

DERWENT-ACC-NO: 1997-450861
DERWENT-WEEK: 199742

TITLE: Construction for sloping roof covered with plates - has truss with several rafters which have on them sheathing which support moisture shielding sheet, all connected by support lamellae with insulation between them

INVENTOR: JAROSCH, K; VETTERS, E

PATENT-ASSIGNEE:

ASSIGNEE	CODE
PFLEIDERER DAEMMSTOFFTECHNIK GMBH & CO	PFLEN

PRIORITY-DATA: 1996DE-1010267 (March 15, 1996)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
EP 795659 A1	September 17, 1997	G	021	E04D013/16
SK 9700341 A3	November 5, 1997		000	E04B007/02
CZ 9700627 A3	September 17, 1997		000	E04B007/02
DE 19610267 A1	September 18, 1997		017	E04D013/16

DESIGNATED-STATES: AT BE CH DE DK ES FI FR GB GR IE IT LI LT LU LV MC NL PT SE SI

CITED-DOCUMENTS:1.Jnl.Ref; CH 661555 ; DE 9417906

APPLICATION-DATA:

PUB-NO	APPL-DATE	APPL-NO	DESCRIPTOR
EP 795659A1	February 25, 1997	1997EP-0103028	
SK 9700341A3	March 14, 1997	1997SK-0000341	
CZ 9700627A3	February 28, 1997	1997CZ-0000627	
DE19610267A1	March 15, 1996	1996DE-1010267	

INT-CL (IPC): E04 B 1/78; E04 B 7/00; E04 B 7/02; E04 D 12/00; E04 D 13/16

ABSTRACTED-PUB-NO: EP 795659A
BASIC-ABSTRACT:

The construction has a truss with several rafters (2) which have sheathing (4) on them. This sheathing supports a moisture shielding sheet (6). On the sheathing and sheet, directly over and parallel to the rafters are elongated support lamellae (8) of highly compressed mineral wool which run in the fall line of the roof and connected to the rafters. These lamellae accommodate a roof load on the roof parts (10,12) located over them.

Insulating material is lain on the damp barrier between the lamellae, It has a concealment on the side facing the roof covering support (10,12) which is open to diffusion, weather resistant and/or waterproof. The concealment is directly and/or indirectly connected with the lamellae.

ADVANTAGE - The construction is insulating, snow and water proof and avoids using multiple components,

CHOSEN-DRAWING: Dwg.1/10

TITLE-TERMS: CONSTRUCTION SLOPE ROOF COVER PLATE TRUSS RAFTER SHEATH SUPPORT MOIST SHIELD SHEET CONNECT SUPPORT LAMELLA INSULATE

DERWENT-CLASS: Q43 Q45

SECONDARY-ACC-NO:
Non-CPI Secondary Accession Numbers: N1997-375593

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Search Results - Record(s) 1 through 1 of 1 returned.

☐ 1. Document ID: NL 193112 B, CH 660765 A, DE 3612858 C , WO 8706198 A, EP 244035 A, FR 2597531 A, NL 8700868 A, NO 8701437 A, LU 86847 A, FI 8701681 A, NO 8705235 A, EP 266382 A, DK 8706607 A, FI 8705548 A, SE 8701509 A, BE 1001037 A, ES 2005145 A, GB 2189273 B, EP 244035 B, IT 1216923 B, CA 1302155 C, ES 2026895 T3, DK 165398 B, NO 171715 B, SE 470215 B, CA 1324245 C, NO 175544 B, EP 244035 B2

L4: Entry 1 of 1 File: DWPI Jul 1, 1998

DERWENT-ACC-NO: 1987-213906
DERWENT-WEEK: 199831

TITLE: Laying rolled mineral fibre material on supports - involves cutting fibre web into lengths equal to space width followed by transverse laying

INVENTOR: KAUFMANN, F; SCHLOSSHERR, H W ; STOYKE, R ; ZINN, E ; BIHY, L ; ROYAR, J ; RUECHEL, F ; SCHLOSSHER, H ; SCHLOSSHERR, H

PATENT-ASSIGNEE:

ASSIGNEE	CODE
ISOVER SAINT-GOBAIN	COMP
GRUENZWEIG & HARTMANN AG	GRUZ
KAUFMANN F & HARTMANN AG	KAUFI

PRIORITY-DATA: 1986DE-3612858 (April 16, 1986), 1986DE-3612857 (April 16, 1986), 1987ES-0001047 (April 10, 1987)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
NL 193112 B	July 1, 1998		000	E04B001/78
CH 660765 A	June 15, 1987		005	
DE 3612858 C	October 1, 1987		007	
WO 8706198 A	October 22, 1987	G	000	
EP 244035 A	November 4, 1987	G	000	
FR 2597531 A	October 23, 1987		000	
NL 8700868 A	November 16, 1987		000	
NO 8701437 A	November 9, 1987		000	
LU 86847 A	December 7, 1987		000	
FI 8701681 A	October 17, 1987		000	
NO 8705235 A	February 29, 1988		000	
EP 266382 A	May 11, 1988	G	000	
DK 8706607 A	December 16, 1987		000	
FI 8705548 A	December 16, 1987		000	
SE 8701509 A	October 11, 1988		000	
BE 1001037 A	June 20, 1989		000	
ES 2005145 A	March 1, 1989		000	
GB 2189273 B	June 20, 1990		000	
EP 244035 B	October 16, 1991		000	
IT 1216923 B	March 14, 1990		000	
CA 1302155 C	June 2, 1992		000	B44B007/00
ES 2026895 T3	May 16, 1992		000	B44B007/00
DK 165398 B	November 23, 1992		000	B44B007/00
NO 171715 B	January 18, 1993		000	B44B007/00
SE 470215 B	December 6, 1993		000	E04B001/76
CA 1324245 C	November 16, 1993	F	000	E04B001/62
NO 175544 B	July 18, 1994		000	E04B001/74
EP 244035 B2	May 17, 1995	G	014	B44B007/00

DESIGNATED-STATES: DK FI NO US AT BE CH FR GB IT LU NL SE ES GR AT BE CH FR GB IT LI LU NL SE AT BE CH ES FR GB GR IT LI LU NL SE AT BE CH ES FR GB GR IT LI LU NL SE

CITED-DOCUMENTS:EP 101376; GB 2084921 ; US 3730081 ; US 4007767 ; US 4288968

APPLICATION-DATA:

PUB-NO	APPL-DATE	APPL-NO	DESCRIPTOR
NL 193112B	April 13, 1987	1987NL-0000868	
CH 660765A	July 8, 1986	1986CH-0002755	
DE 3612858C	April 16, 1986	1986DE-3612858	
WO 8706198A	April 16, 1987	1987WO-EP00208	
EP 244035A	April 16, 1987	1987EP-0200792	
EP 266382A	April 16, 1987	1987EP-0902501	
ES 2005145A	April 10, 1987	1987ES-0001047	
CA 1302155C	April 16, 1987	1987CA-0535041	
ES 2026895T3	April 16, 1987	1987EP-0200792	
ES 2026895T3		EP 244035	Based on
DK 165398B	April 16, 1987	1987WO-EP00208	
DK 165398B	December 16, 1987	1987DK-0006607	
DK 165398B		DK 8706607	Previous Publ.
NO 171715B	April 16, 1987	1987WO-EP00208	
NO 171715B	December 15, 1987	1987NO-0005235	
NO 171715B		NO 8705235	Previous Publ.
SE 470215B	April 10, 1987	1987SE-0001509	
CA 1324245C	April 15, 1987	1987CA-0534824	
NO 175544B	April 6, 1987	1987NO-0001437	
NO 175544B		NO 8701437	Previous Publ.
EP 244035B2	April 16, 1987	1987EP-0200792	

INT-CL (IPC): B44B 7/00; C03B 37/10; C03C 0/00; E04B 1/62; E04B 1/74; E04B 1/76; E04B 1/78; E04D 5/08; E04D 13/16

RELATED-ACC-NO: 1986-253174

ABSTRACTED-PUB-NO: CH 660765A
BASIC-ABSTRACT:

The mineral fibre contg. a bonding agent, is available in a rolled bale. It is laid over a longitudinal field, enclosed by lateral supports, e.g. two roof beams. After unwinding from the roll, the web is cut to a width equal to that of the space available, plus necessary addition, and finally clamped between the supports.

The web of standard width is divided by transverse cuts into lengths equal to the distance between the supports (12) plus the necessary extra portion. Strips then laid in the sideways direction, with the cut edges against the supports and their sides abutting each other.

ADVANTAGE - Min. trimming or material wastage when adapting to spaces of different widths.
ABSTRACTED-PUB-NO:

DE 3612858C
EQUIVALENT-ABSTRACTS:

Mineral fibre material for use as insulation between roof rafters is supplied in rolls in a width which is often not enough to fill the space between the rafters or too wide and causes bulges. It is suggested therefore to cut the material on the rolls crosswise with a sharp knife at a distance equal to the distance between rafters and to lay these cut strips next to each other for a complete filling of the space.

ADVANTAGE - This does not require rolls of different width and results in no wasted material. (7pp)d

EP 244035B

Method of applying making lines to a mineral fibre web containing a binding agent, in which the surface (41) of the mineral fibre web (38) lying on a running conveyor belt, particularly the production belt, is subjected to the local heating action of a locally arranged heating device, characterised in that a roll (1) is used as the heating device, whose peripheral surface (29) is placed on the surface (41) of the mineral fibre web (38), and which is rotated at a speed which results in the peripheral speed of the roll (1), which at least approximately corresponds to the speed of conveyance of the mineral fibre web (38), in that locally sharply defined, parallax, linear heating zones (26) are heated to a temperature which exceeds the temperature of decomposition of the binding agent in the mineral fibre web (38), and in that the areas of the peripheral surface (29) of the roll (1) located between the heating zones (26) are protected against the transfer of heat to the mineral fibre web (38). (13pp)

GB 2189273B

A method of installing mineral fibre material provided in roll form into an elongate installation space bounded by lateral supports, in which the roll form mineral fibre material is initially unrolled, then cut to size according to the width of the installation space at the installation site, plus an over-measure, and is then inserted with a push-fit action between the supports, characterised in that the mineral fibre material is sub-divided into longitudinal portions by cuts extending transversely to the length of the strip and the length of the portions corresponds to the local width required for installation, plus an over-measure, and in that the mineral fibre panels produced by the cut off lengths are inserted between the supports that they have their cut edge against the supports and the edges which were their lateral edges in their previous roll form bear one on another.r

TITLE-TERMS: LAY ROLL MINERAL FIBRE MATERIAL SUPPORT CUT FIBRE WEB LENGTH EQUAL SPACE WIDTH FOLLOW TRANSVERSE LAY

DERWENT-CLASS: P78 Q43 Q44 Q45

SECONDARY-ACC-NO:
Non-CPI Secondary Accession Numbers: N1987-160050

Terms	Documents
de-3612858-$.did.	1

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Search Results - Record(s) 1 through 1 of 1 returned.

☐ 1. Document ID: NL 193112 B, DE 3612857 A , CH 659845 A, GB 2189273 A, DK 8701815 A, US 4866905 A, AT 8700795 A, SE 470215 B, CA 1324245 C, NO 175544 B, DE 3612857 C2

L3: Entry 1 of 1 File: DWPI Jul 1, 1998

DERWENT-ACC-NO: 1986-253174
DERWENT-WEEK: 199831

TITLE: Mineral fibre insulating strip - is cut along transverse marking lines to form insulating plates

INVENTOR: BIHY, L; ROYAR, J ; RUECHEL, F ; STOYKE, R ; BIHLY, L ; RUCHEL, F

PATENT-ASSIGNEE:

ASSIGNEE	CODE
ISOVER SAINT-GOBAIN	COMP
GRUENZWEIG & HARTMANN AG	GRUZ

PRIORITY-DATA: 1986DE-3612857 (April 16, 1986), 1986DE-3612858 (April 16, 1986)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
NL 193112 B	July 1, 1998		000	E04B001/78
DE 3612857 A	September 18, 1986		022	
CH 659845 A	February 27, 1987		000	
GB 2189273 A	October 21, 1987		000	
DK 8701815 A	October 17, 1987		000	
US 4866905 A	September 19, 1989		000	
AT 8700795 A	July 15, 1991		000	
SE 470215 B	December 6, 1993		000	E04B001/76
CA 1324245 C	November 16, 1993	F	000	E04B001/62
NO 175544 B	July 18, 1994		000	E04B001/74
DE 3612857 C2	December 22, 1994		008	E04B001/88

APPLICATION-DATA:

PUB-NO	APPL-DATE	APPL-NO	DESCRIPTOR
NL 193112B	April 13, 1987	1987NL-0000868	
DE 3612857A	April 16, 1986	1986DE-3612857	
GB 2189273A	April 13, 1987	1987GB-0008797	
US 4866905A	April 8, 1987	1987US-0035863	
SE 470215B	April 10, 1987	1987SE-0001509	
CA 1324245C	April 15, 1987	1987CA-0534824	
NO 175544B	April 6, 1987	1987NO-0001437	
NO 175544B		NO 8701437	Previous Publ.
DE 3612857C2	April 16, 1986	1986DE-3612857	

INT-CL (IPC): C03B 37/10; E04B 1/62; E04B 1/74; E04B 1/76; E04B 1/78; E04B 1/88;

E04C 2/16; E04D 3/35; E04D 13/16

RELATED-ACC-NO: 1987-213906

ABSTRACTED-PUB-NO: DE 3612857A
BASIC-ABSTRACT:

The strip of insulating material, particularly of mineral fibre, coils into a roll. This is divided by transverse modular marking lines (5). When the strip (1) is cut through along these lines after unrolling, rows of plates of insulating material are formed.

The lines can typically be at 10 cm. intervals and can be formed by ink or dye, so as not to weaken the material. The latter can have a weight of between 10 and 40 kg. per cu.metre and the plates formed can be clamped between roofing spars.

USE - Involves minimum amount of trimming on site.
ABSTRACTED-PUB-NO:

DE 3612857C
EQUIVALENT-ABSTRACTS:

The insulation made of mineral fibre felting is rolled up to form clamped plates between adjoining rafters. Thus the fibre web (1) is marked out in modular lines (5) so that with the web stretched out the plates can be cut up, singly in adjacency along the lines. The lines (5) are spaced by 100mm, and are optically effective giving lines which are coloured and in no way weaken the mineral fibre web itself (1).

The volumetric weight of the web amounts to 10-25 kg/m3, and additional 6-7% by weight binder stiffens the individual fibre plates (10) produced by the web cuts. In rolled condition the fibre web is compressed to a ratio of 1:2.5. Then plates are additionally turned so their sides become the ends with excess length so the plate remains compressed as laid between rafters in a three-plate layer in which the topmost plate is thinner, using the next demarcated (5) strip of the web to fill out the rafter spaces as required, e.g. at the ends. The assembled fibre insulation can be closed off above by a layer of polyurethane film.

USE/ADVANTAGE - Roof insulation. Mineral fibre web rolled up for compression prior to modular marking out for easy plate forming and end strips for precision fit in rafter space in one-man operation.

US 4866905A

From a mineral fibre strip supplied in roll form, portions are cut off, the length of which corresponds to the width of a rafter area between rafters plus an oversize designed to produce a clamping effect. Formed in this way, the mineral fibre panels are so inserted into the rafter area that the lateral edges of the mineral fibre strip form the top edge and the bottom edge of the panels.

By reason of the considerable width of the mineral fibre strip, insulation of one rafter area over its entire length requires only a few mineral fibre panels, with few joints being produced. To facilitate guidance of the cut for separating the portions (L), it is possible to provide on one side of the mineral fibre strip marking lines which can, during production, be generated by a corotating roller having linear heated zones.

USE - For roof insulation. (9pp)

CHOSEN-DRAWING: Dwg.1/2 Dwg.1/2

TITLE-TERMS: MINERAL FIBRE INSULATE STRIP CUT TRANSVERSE MARK LINE FORM INSULATE PLATE

DERWENT-CLASS: P78 Q43 Q44 Q45

SECONDARY-ACC-NO:
Non-CPI Secondary Accession Numbers: N1986-189324

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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